TRAFFIC ENGINEERING

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111. RELATIONSHIP OF THE ROADWAY TO HIGHWAY TRAFFIC SAFETY- Milton Harris (California Highways and Public Works, November 1938)

The engineering approach to the traffic accident problem takes the same form as the investigation and solution of any other matter that falls within the realm of the engineers. In dealing with traffic, as with other physical elements, the primary consideration is the collection of sufficient factual data to form a sound basis for logical reasoning and the eventual application of engineering principles to effect a solution of the problem presented.

Of the 12,867 con- tributing causes report- ed in 1937, 855 or 6.65% represent those concerning the roadway. A more common evaluation would be to say that the roadway was responsi- ble for 61 deaths and 724 personal injuries dur- ing the last year.

To clearly portray the relationship of road way causes to the var- ious elements of highway engineering, the ac- companying chart has been prepared, in which the relative percentages of report- ed causes concern- ing the roadway alone are shown pyramided on a cross-section.

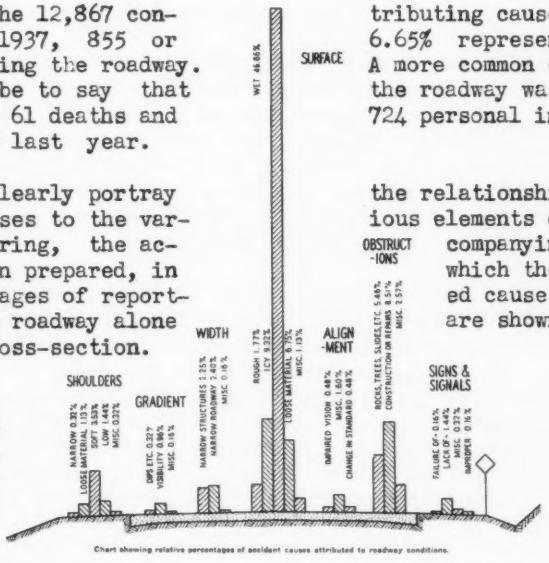

Chart showing relative percentages of accident causes attributed to roadway conditions.

The roadway is immediately apparent as requiring the greatest attention to effect traffic safety. Slippery surface alone accounts for more than one half of the problem.

Obstructions on or along the roadway account for over 16 per cent of the total causes attributable to roadway, with construction or repairs responsible for more than half. Shoulder conditions contributed almost 7 per cent of the hazard while width contributed approximately 5 per cent.

Solution of traffic problems by the application of scientific principles is not as easy as it sounds. It calls for the use by engineers of all the scientific resources available, the science of psychology and education, the application of the principles of laws and medicine and the fundamentals of politics. Above all it calls for executive ability, for no matter how logical the solution or how obvious the answer may be to a traffic problem, it still needs a directing head to put it into action and effect a change.

The Highway Engineer has come to accept as a fact that traffic should be directed by others than himself; yet, for example, our railroads do not have a separate operating corporation to run their trains ! How much more logical that the engineers who design, build and maintain our highways should operate them, applying scientific principles for control of traffic as they have applied them in building the road so that traffic can flow freely and uniformly.

112. INSPECTION OF VEHICLES-Arthur Magee (American Association of Motor Vehicle Administrators, October 1938)

First inspections in New Jersey were conducted in 1928 and 1929 by 2,500 appointed stations. Results were not satisfactory because of lack of cooperation on the part of stations. In 1931, the legislature passed a law providing for inspection upon proclamation of the Governor. No proclamation was issued so no inspections were made. The present Motor Vehicle Inspection Law became effective June 30, 1936. Inspections stated January 10, 1938 in twenty-eight stations.

Prior to actual work, the garagemen of the state were given an opportunity to become familiar with the procedures and the civil service appointed operating personnel was given a course of training. At the beginning there was the usual trouble of congestion and misunderstanding. Most of the troubles have now been eliminated and the press is supporting the program. It is contemplated that in the future, operator examinations will also be given in all of the stations. Included in the article is a summary of activities from January 10, 1938 to July 9, 1938.

113. PUBLIC RELATIONS WORK OF STATE POLICE AND HIGHWAY PATROLS-Colonel B. Marvin Casteel (American Association of Motor Vehicle Administrators)

One of the most important phases of police work is that of public relations. This article mentions and discusses a large number of itmes pertinent to this subject. Among them are: That men should be properly qualified and trained;

treatment of all citizens must be uniform; a mis-step made by an individual officer will bring discredit to the entire organization; commanding officers must allow members to become lax at no time; if enforcement policies are changed the public should be made aware of the change; all persons must be treated fairly; the individual officer must set an example of good conduct; the enforcement program should be designed to prevent as well as prosecute; and a sound safety program should be sponsored.

114. THE TRAFFIC ENGINEER LOOKS AT SCHOOL SAFETY-Donald McNeil (Fifteenth Annual Regional Safety Engineering Conference, Pittsburgh, Pa., Nov. 15-17)

Many educators seem to be of the opinion that school curricula is so complete today that little time is available for safety education. The fact that seven out of eight casualties in traffic accidents are over twenty years old seems to confirm them in the opinion that the problem is not theirs.

Further research in the records of traffic accidents reveals that traffic safety instruction in schools is profitable.

In 1933, the year traffic safety instruction in schools in Pittsburgh was instituted, there were 20 fatalities among school children and 553 injuries. This same year 100 adults were killed and 2,533 injured. After four years during which traffic safety has been taught continuously there were, in 1937, 11 school children fatalities and 541 injuries and 110 adult fatalities and 2,912 injuries. The four year reduction in accidents involving school children amounts to 4% while adult casualties have increased 19½%.

The child of today is tomorrow's adult. The safety lessons taught the child now will be retained by him as an adult. Available means for teaching traffic safety to adults--newspapers, radio, billboards, public lectures--are not dependable mediums to reach everyone; elementary schools are. Therefore it seems desirable to intensify the teaching of traffic safety in shcools, making available the little time it would add to the curriculum. Society is the loser when the investment in education of the child is snuffed out with his life just as he is about to return this investment to society.

115. PAVEMENT TYPES (New York Times, October 9, 1938)

A new type of concrete roadway with non-skid surface of diamond shaped humps was laid recently between DuBois and Clearfield, Pennsylvania, by the Vacuum Concrete process. An

air tight mat with the imprint form is laid on the soupy concrete and a suction hose removes the excess water and compacts the concrete.

116. HIGHWAY TUNNELS IN WESTERN STATES-Regional Office, U. S. Bureau of Public Roads (Public Roads, Sept. 1938)

Highway tunnels are old. The Assyrians constructed a tunnel under the Uphrates and the Romans used highway tunnels, including one 3000 feet long near Naples. The latter was 75 feet high at portals to provide some daylight. In France canals use some notable tunnels. In modern times railroads built most of the famous tunnels, including the 12 mile Simplon, Mt. Cenis, and St. Gothard bores through the Alps;while in American we have Hoosac in Massachusetts, Rogers Pass in British Columbia, and the Moffat in Colorado.

For high speed automobile traffic in the West some 35 tunnels have been made, of which the 5,613 foot East Rim Road tunnel in Zion National Park, the 4,233 foot Wawona in Yosemite, and the 3,213 foot Broadway in California require ventilation. While most western tunnels are straight, the Willametter of Oregon is curved, with an inner sidewalk to provide safe sight distance, and the twin Broadway has reverse curves at the ends to spread the spacing from 15 feet at the portals to 100 feet elsewhere so that blasting in one tunnel would not endanger the other bore. Stell lining in a western tunnel was first used in the Ventura-Maricopa tunnels.

Seismographic exploration is used if the character of the earth is in doubt, and the faces of the hills should be opened or even short exploratory tunnels may be justified to determine the material and the cost of the excavation.

Tunnels have the following advantages over open cuts:

(1)Better location, reduced curvature.
(2)Maintenance is lower unless ventilation is required.
(3)Less scar or spoiling of landscape, less erosion.

Because of portal cost,tunnels of less than 80 feet length are seldom justified unless the cover exceeds the critical 80 to 100 feet depth. If over 1500 feet long, they require ventilation, also if shorter ones have vertical curves likely to create gas pockets. An average car exhausts 1.5 cubic feet of carbon monoxide per minute on grades not exceeding 4%. If two parts in 10,000 of ar are allowable, 5000 cubic feet of fresh air per minute per car is required. In case of fire

the fans should be stopped as soon as all persons are evacuated. Fire doors might be helpful.

All tunnels should be planned for eventual lining. Since the height should be at least 14 feet, an economical section is approximately semi-circular. This gives room for 3 foot sidewalks without encroaching on traffic lane widths. The travelways should be wider than the early 20 foot pavements, because vision at best may be none too good. The Wawona has 24 foot pavement. Timber lining is used in some western tunnels. In good rock lining may be unnecessary, or pneumatically applied mortar may be used on the walls and ceiling to prevent raveling. Where concrete is used for lining, a minimum of 12 inches is needed unless combined with steel structure. Spring water should be led through tile toward the portals. Water that does enter the tunnel should be led in drains under the sidewalk, where also the ducts for cables may be located.

Because the eye requires time to adapt itself to sudden reduction or increase of light intensity, provision may need to be made to make the transition in day-time more gradual. The Broadway tunnel uses 200 feet of diffusing screen or grilles over the approach. This prevents sunshine from passing directly onto the transition section. Or, the entrance (inside the tunnel) may be brilliantly lighted with a concentration of overhead lamps when the sunshine outside is brilliant.

117. RELATIONSHIPS BETWEEN TYPES OF FATAL TRAFFIC ACCIDENTS AND AGES OF VICTIMS-Professor Roger L. Morrison (Highway Research Abstracts, Eighteenth Annual Meeting of the Highway Research Board of the National Research Council)

The usual information as to the age groups of persons killed in traffic accidents appears to be of less value than it would be if the general types of accidents were reported separately. This is because there is definite relation between the age of victims and the manner in which most of them are killed.

An analysis of 905 fatal accidents occurring in Detroit during the past three years showed that nearly 90 per cent of all child victims under 12 years of age were killed as pedestrians, most of them darting out between parked cars. From 12 to 15 years the greatest hazard was to children riding bycycles, hitching on trucks, roller skating and coasting. From 16 to 30 years of age the majority were killed as occupants of motor vehicles. Above that age the number of persons killed in vehicles steadily declined while the number of ped-

estrians killed rose rapidly. Of persons over 58 years old who were killed, more than 90 per cent were pedestrians. Three fourths of the drivers killed were 16 to 40 years old.

All age groups under 45 years furnished fewer pedestrian fatalities than their proportion of the total population, but over that age the ration increased until above 85 years it was 13 times as great as the proportion of the population in that group.

From 15 to 59 years of age the per cent of fatalities to occupants of motor vehicles is greater than the corresponding per cent of total population, with a peak from 20 to 24 years. There were other peaks above 70 years of age, so far as ratios were concerned, but they were caused by comparatively few fatalities, and those were usually passengers.

A knowledge of the different maximum hazards to different age groups should be of value in safety education work.

118. GETTING THE MOTORIST'S ATTENTION-Michael A. Connor (Safety Engineering, October 1938)

The defeatist attitude of many must be overcome. To get greater effectiveness out of present safety activities it is recommended that there be a national coordinator who could better time campaigns and bring to an end duplications of effort.

The author believes that one of the main reasons why motorists are not more co-operative with safety authorities is the fault of official agencies. The motorist is "tossed around"-he is forced to submit to needless red tape and those who relieve him of his cash for payment fo various fees force him to stand in line for hours, as well as serving him generous doses of abuse.

A serious fault to be found with the present attack on traffic accidents is that, although many devices are being widely used, they are not delivering full effectiveness because they are not coordinated. As a consequence, efforts are being duplicated.

Another fault with the present attack is that the proponents of one idea scoff at all others. The cause of accidents are varied and therefore the means to prevent them must be equally varied. The police, courts, the manufacturers and the engineers all have their part to play.

119. SAME OLD PROBLEM IN ENGLAND--I.T.E.Publications Committee (American City, December 1938)

Whereas in this country the traffic casualties are fairly evenly divided between pedestrians and motorists, in England only 14 per cent of those fatally injured are motorists, while 47 per cent are pedestrians, 22 per cent bicyclists, and 15 per cent motorcyclists. Whereas American traffic fatalities are counted in the thirty thousands. English traffic deaths are between four and five thousand annually.

But there is a traffic problem in England, for the four or five thousand deaths are not only so many in a population of 40 millions, but so many in a tight little isle. H.Alker Tripp, Assistant Commissioner of Police, Scotland Yard has just issued a book (Edward Arnold & Co.,London) compact with facts on "Road Traffic and Its Control." In the very beginning he speaks of "an intricacy of contending factors," which certainly strikes the keynote for American as well as English thinking and acting in the new world of racing,weaving,parking, high-powered vehicles in sleepy, old-fashioned streets and roads.

There are many familiar problems in this book:
The regulation of pedestrians.
The enforcement aspect.
Conditions of the vehicle.
The accident-prone driver.
Street lighting.
White lines.
Education, engineering, enforcement.

Mr. Tripp points out that accidents are multifarious in character, effect and immediate cause; but that nearly 90% of the total casualties are caused by unexpected encounters. The problem of safety on railways has only been solved with the help of very elaborate and costly mechanical arrangements, for coordinating movement and for isolating unit from unit. There seems little doubt that safety on the road must be bought and paid for in the same way.

VEHICLE-ACTUATED SIGNALS CONTROL THE COMPLEX INTERSECTION OF TWO MAIN STREETS AND TWO SECONDARY STREETS IN LIVERPOOL, ENGLAND

Light-ray detectors at two points on Queen's Drive and two points on Mairhead Avenue in advance of the intersection, and across each roadway of Queen's Drive from the center island, give individual attention to traffic on every roadway of the intersection, but permit the heavier traffic on Queen's Drive to flow freely with least delay to cross traffic

120. RESEARCH ON THE ALCOHOL PROBLEM-Lieutenant F. W. Kreml (Highway Research Abstracts, Eighteenth Annual Meeting of the Highway Research Board of the National Research Council)

A study was made of the drinking drivers involved in personal injury accidents and of the drinking of drivers in the general population. A total of 270 persons were tested in the first study and 1,750 persons in the second. Conclusions drawn were as follows:

1. The highest percentage of drinking drivers occurs in the early morning hours and over the week-end.

2. The largest number of drinking drivers occurs in the early evening and over the week-end.

3. The peak age for drinking drivers is from 25 to 30.

4. Women drink and drive as much as men when the number of women driving at various hours of the day is considered.

5. The percentage of drinking drivers in the general population varies as does the percentage of drinking drivers in the personal injury accident group but falls considerably lower at all times.

6. The percentage or number of drivers involved in personal injury accidents varies as does the percentage or number of drinking drivers.

7. As the blood alcohol content increases, the number of drivers appearing in the personal injury accident group increases out of all proportion over that in the general driving population.

8. As alcohol increases, accidents increase and at a rate somewhat proportionate to the increase in alcohol.

9. Equal percentages of drinking drivers are found in the accident group and in the general population group at a point near 0.5 part of alcohol per thousand parts of blood, indicating that alcohol in that amount is not necessarily a significant cause of accidents.

10. It has not yet been objectively and conclusively proved just how important a causative factor alcohol is, and, because of the complexity of the whole accident problem, it may never be proved. The data gathered in this study, however, point in one direction only. They confirm a self-evident fact that alcohol is a major cause of automobile accidents.

NEWS ABOUT THE TRAFFIC ENGINEERING PROFESSION

REGIONAL INSTITUTE OF TRAFFIC ENGINEERING. Rutgers University announces a Regional Institute of Traffic Engineering to be held February 13 to 25, 1939. This course will be offered by the Rutgers Bureau of Public Safety and Rutgers College in cooperation with the Institute of Traffic Engineers.

The two weeks Institute will be designed for city engineers, municipal and state officials. It is the intention of the Rutgers Traffic Engineering Institute to concentrate on the practical traffic engineering approaches to the control and regulation of traffic in order to provide this group with information which can be used immediately in setting up a program of traffic engineering within their respective communities or organizations. Most of the two weeks will be spent on a few of the most important traffic engineering subjects. It is the feeling that more can be accomplished through this concentration of time and attention on a few subjects than to cover many subjects only lightly.

An Advisory Committee, composed entirely of members of the Institute of Traffic Engineers, has been appointed to prepare and supervise the program for the training school. The personnel of the committee is:

Leslie J. Sorenson, Honorary Chairman
Harold F. Hammond, Chairman
John T. Gibala
Burton W. Marsh
Robert A. Mitchell
Hawley S. Simpson
Arnold H. Vey

Professor Lawrence B. Tipton, head of the Bureau of Public Safety informs us that announcements and application blanks will be mailed to all city and state officials along the eastern seaboard January 1. The enrollment has been set at a maximum of fifty. Applications must be in not later than February 1. The tuition for the two weeks course will be $10.00.

Those who wish further information about the Rutgers Institue may write to the Bureau of Public Safety, Rutgers University, New Brunswick, New Jersey, or to the Institute of Traffic Engineers, 60 John Street, New York, New York.

MEMBERS ATTEND ASSOCIATION OF STATE HIGHWAY OFFICIALS IN DALLAS. Walter F. Rosenwald, Harry H. Harrison, Wilbur S. Smith, Robert O. Swain attended the Convention of State Highway Officials in Dallas, Texas the week of December 4. These members were guests of Mr. Charles G. Beckenbach, City Traffic Engineer of Dallas, on several traffic observation tours over the city.

EXECUTIVE COMMITTEE OF THE AMERICAN ASSOCIATION OF MOTOR VEHICLE ADMINISTRATORS RECOMMENDS ADOPTION CHANGES IN UNIFORM VEHICLE CODE. The Executive Committee of the American Association of Motor Vehicle Administrators, at a recent meeting, unanimously approved adoption of the changes made in the Uniform Vehicle Code. The Committee endorsed the motion that each individual State Motor Vehicle Administrator recommend the changes made in the Uniform Vehicle Code to his legislative body for incorporation into the present state motor vehicle law as soon as possible.

PUBLIC RELATIONS COMMITTEE. President Sorenson has again appointed Hawley S. Simpson chairman of the Public Relations Committee and asks that the following members assist him:

J. W. Arch Bollong
Harold S. Buttenheim
W. Graham Cole
Harry H. Harrison
E. W. James
Miller McClintock
Evan J. McIlraith
Robert H. Nau
Sidney J. Williams

TWENTY-TWO FELLOWSHIPS ARE AWARDED AT THE YALE BUREAU FOR STREET TRAFFIC RESEARCH. Listed below are the names of the men who are the recipients of the awards:

Walter C. Benedict
William W. Bradley
Stephen E. Butterfield
Saville Dorfman
Henry K. Evans
Frank B. Garrett
James K. Gibson
Robert S. Holmes
Fred W. Hurd
Foster M. Kunz
John W. Lowell
Charles W. Prisk
Bert W. Woodburn, Jr.
Light B. Yost
Alvin Edelstein
Herbert L. Slover
Douglas A. Bowers
Bernard C. Hartung
Henry W. Osborne
Harold T. Sorensen
Francis E. Twiss
Ralph Herbert Sawyer

1939 REGIONAL SAFETY CONFERENCES. American Society of Safety Engineers announces the 1939 Regional Safety Conferences:

February 16-17--Southern Safety Conference, Jackson, Miss.
February 23-24--15th Annual Easter Safety Conference, Newark, New Jersey
March 27-29--10th Annual Greater New York Safety Conference New York, New York
April 3-4--18th Annual Massachusetts Safety Conference, Boston, Massachusetts
April 27--12thAnnual Rock River Valley Safety Conference, Beloit, Wisconsin
May 9-11--17th Annual Mid-west Safety Conference, Chicago Illinois
May 18--4th Annual Upper Mississippi Valley Safety Conference, Tomah, Wisconsin
May 22-24--Michigan State-Wide Safety Conference, Detroit, Michigan
June 1--12th Annual Fox River Valley & Lake Shore Safety Conference, Sheboygan, Wisconsin
June 8--Wisconsin River Valley Safety Conference, Wausau, Wisconsin

TRAFFIC ENGINEER WANTED. It has come to our attention that there is an opening for a traffic engineer in the Police Department of the City of Flint, Michigan.

Will those of you who are definitely interested please make application immediately to Chief Neal Anderson, Chief of Police, Flint, Michigan?

OUR MID-WEST AUXILIARY. The F and F Club, a mid-western auxiliary of the Institue of Traffic Engineers, held its quarterly dinner meeting at Radigan's near Lake Michigan in Wisconsin, Tuesday, December 6. Mr. E. J. O'Meara presided due to the fact that he claimed to have shot the venison which was used for the main course. Mr. O'Meara after a short discussion on the appearance of the halter marks on the deer's neck introduced the following speakers:

Mr. W. H. Klapproth (Director) who spoke on the prospects of obtaining exercise in the winter time when the club finds it unable to fish.

Mr. H. F. Ilgner (Former Director) furnished the plans for channelizing Rest Lake in Northern Wisconsin.

Mr. George Barton gave the club some idea of the number of fishing trips necessary to get by the Membership Committee of the Institute.

Mr. W.R. Abbott gave his reasons for not wanting President Roosevelt on the club's next fishing trip.

Mr. M. E. Bruening at last produced the reasons why his boss always uses a cane pole for wall-eyed pike.

Mr. W. R. McConochie refused to talk with his mouth full so could not speak all during the evening.

Mr. Ralph Michel gave a short synopsis of a traffic study he made in Sioux falls, S.D. last year.

Mr. Wm. Brandes and Mr. Charles Rex collaborated on a mathematical discussion of the number of lumens involved in the action of a plumbers candle under a paint bucket used to heat the seat of E. J. O'Meara's trousers at the time of the alleged shooting the aforementioned deer.

Mr. W. E. DeYoung took down the minutes of the meeting.

President Leslie J. Sorenson, Director W. F. Rosenwald and Mr. Robert H. Nau were unable to attend after looking over the proposed program.

GREATER NEW YORK MONTHLY MEETINGS. The first monthly dinner meeting of the Greater New York Region was held December 20. One of the highlights of the evening was the presentation of a motion picture, MILLIONS FOR SAFETY. This new motion picture, which has just been completed, is the behind-the-scenes story of men whose job is safety and shows how the Port of Authority handles a tremendous volume of traffic--more than twenty-three million cars annually using its bridges and tunnels. Following the showing of the picture, Mr. Nathan Cherniack gave a brief review of the Port of Authority's interest in the traffic problem.

It is planned to hold these informal dinners monthly until the 10th Greater New York Safety Convention, March 27-29. At that time, the Greater New York Institute activities will reach a climax in its regional convention.

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THE OBJECTIVES OF THE INSTITUTE

The objects of the Institute shall be the advancement of the art and science of traffic engineering, the fostering of traffic engineering education, the stimulation of original research in traffic engineering, the professional improvement of its members, the encouragement of intercourse between men with mutual interests in traffic engineering, and the establishment of a central point of reference and union for its members. (Article I, Section 4 of the Constitution of the INSTITUTE OF TRAFFIC ENGINEERING).

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